square or hexagonal). Use of a conductive polymer minimizes static electricity on the rig floor. Mating protrusions and indentations on the lid and bottom of the package help to stabilize the bit containers when stacked.

In at least some embodiments, unsafe handling practices are discouraged by welded loop handles and the retention of strapping within grooves in the package, which will be explained in more detail later.

The disclosed innovations, in various embodiments, provide one or more of at least the following advantages:

durability,

relatively inexpensive to manufacture,

reusable,

one package can handle a range of bits of a given bore size;

promotes safe handling of packaged bits.

BRIEF DESCRIPTION OF THE DRAWING

The disclosed inventions will be described with reference to the accompanying drawings, which show important sample embodiments of the invention and which are incorporated in the specification hereof by reference, wherein:

FIGS. **1**A–B show perspectives of the innovative container, first with the lid off, then with it on.

FIGS. **2**A–B show the inside of the lid looking straight down into it and a perspective, showing the pin holder.

FIG. **3** shows the bottom of the container.

FIG. **4** shows a prior art package in which fixed-cutter bits have been transported.

FIG. **5** shows a sample box of heavyweight corrugated cardboard in which small drill bits have usually been shipped in the past.

FIG. **6** shows a general schematic of a conventional rotary cone bit.

FIG. **7** shows a general schematic of a conventional fixed cutter bit.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The accompanying drawings show important sample embodiments of the invention and are incorporated in the specification hereof by reference.

In an exemplary preferred embodiment, shown in FIGS. **1***a*–**1***b*, the container **10** consists of a body **100** and lid **200**, which together form a generally cylindrical shape. The inside diameter of the lid **200** is very slightly larger than the body **100**, providing a slip fit between the two. The lid overlaps the body for at least several inches, providing a more hermetic seal. The base **110** of the body, unlike the rest of the container, is not round, but has a shape, such as the square shown, which discourages rolling if the container falls on its side. Recessed channels **108** in the lid and base, and reproduced in the upper portion of the body of the container, provide a secure routing for the strapping which will hold the lid on the container during shipping. Sturdy handles **106** are offset from the strapping channels **108** to provide a means for hand or machine lifting. Finally, protrusions **204** in the lid of the container are sized to fit inside a cavity in the base of the container, providing some locking together of containers when they are stacked.

In this sample embodiment, the body and lid are formed from low-density polyethylene, with glycerol monostearate (GMS) added to increase the conductivity. The walls of the container body are in the range of 0.25" to 0.375" thick. A cushion of an elastomer foam is fastened in the bottom of the container and is generally several inches thick.

When a roller cone drill bit is ready for shipment, it is placed cones-down inside the body of the container, with the cones resting on the foam cushion. The lid slip-fits onto the top of the body, and is fastened to the body by strapping. Inside the lid, a pinholder sleeve **210** secures the pin end of the bit from loose lateral movement. The cone end of the bit is laterally stabilized by the contact between the cone teeth and the cushion. When the bit is packaged, a desiccant is generally added to the package to absorb moisture and discourage corrosion. This can be any number of commercially available desiccants.

Preferably the polymer lid is fastened to the body for shipping by strapping **120** only, and not by any other attachment mechanism. This is a safety feature, since strapping (unlike latches, fasteners, or molded screw threads) is not likely to be partly fastened: usually strapping will be either intact or broken, and it is easy to see which. By contrast, it is possible for built-in latches to break, or for some fasteners to be lost, or for screw thread engagements to be left untightened. The currently preferred strapping is a steel strapping, the ends of which are generally fastened together by a metal "staple", whose ends are bent over. A nylon strapping can also be used to secure the lid.

When the packaged bit is to be prepared for use at a remote location, the preferred package can be turned upside down, the strapping cut, and the body of the container lifted off. The pinholder sleeve in the lid stabilizes the bit in the cones-up position, providing a stable platform so that nozzles can easily be changed out. Other "bit-dressing" operations, as well as inspection, can also be easily performed in this position.

In the presently preferred embodiment, a further feature has been added to the container to secure the lid after the strapping is removed. In this feature, two heavy-duty T-shaped rubber straps **130** are attached to opposite sides of the lid, offset from the handles. Two generally U-shaped metal catches **132** on the container itself mate with the straps to hold the lid closed.

In an alternate class of embodiments, a temporary strapping, e.g. of nylon, can be included in the container for closing the lid after the initial opening, but this is less preferable, since unattached items are more easily lost.

Details of the Lid

The inside of lid **200** is seen in FIGS. **2**A–B. The cylindrical pin holder **210** is seen in the perspective of FIG. **2**B, but is seen only as a thin circle in FIG. **2**A. The construction of the lid requires some further explanation. Rotational molding is preferably used to form the body and lid. Rotational molding is a very economical and reliable procedure, but it is limited in the range of shapes which can be formed. The present inventors found that rotational molding could not easily make a compact lid with a rigidly attached integral pinholder. In the presently preferred embodiment, two pieces are cut out from a single hollow molding, and then attached together to form the lid with integral pinholder. The first piece **220** forms the portion of the lid which is visible when the lid is in place on the container, and has generally cylindrical sides and a circular top, with grooves and protrusions formed into it. The second, inner piece **230** is seen in FIG. **2***a* as a flat-doughnut-shaped piece, from which rises the cylindrical pin holder. The inner and outer portions are preferably attached